

# The Builder.

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THE importance of proper VENTILATION is more generally felt at this time than it was a dozen years ago; that is, larger numbers of persons have become con-

vinced that bad air will kill as certainly as prussic acid, though not so quickly. Individuals have always understood this,—have always laboured to convince the multitudes of the truth of the assertion, and to induce the adoption of means to obtain the fullest supply of pure air; but it is only recently that the masses have been impressed with the fact, and have thought it worth while to employ the means suggested. The evidence that has been brought forward is most conclusive, and abundant: books of all sizes have been written upon it; commissioners to inquire into the state of large towns have recommended "that measures be adopted for promoting a proper system of ventilation in all edifices for public assemblage and resort;" and so, by repeated striking, the impression has been at last communicated to the general tympanum.

The great question now is, how can ventilation be best effected,—in what manner can the vitiated air be removed and fresh air supplied, without producing currents injurious or offensive to the human frame? And to tell the truth, notwithstanding the numerous experiments made within the last thirty or forty years, and the *tonnes* that convey their results to the world, it is not easy to reply to the question. The same means cannot be uniformly adopted in all cases, but require to be adapted to varying circumstances. No exact rules can be laid down; which must depend on the intelligence of the persons to whom the structure is entrusted. A change in the temperature of the external atmosphere, or of the direction of the wind, may alter entirely the effect of a mechanical arrangement; and the presence of a larger or smaller number of persons than was expected, would require corresponding changes in the supply of air, and the temperature to be artificially given to it.

We have recently, on more than one occasion, directed attention to this subject, and our columns have been open for the particulars of every invention bearing on it, and for every suggestion likely to prove of value in the investigation of principles. We are forced, however, to recur to it by the letters of influential correspondents, pointing out the magnitude of the experiments which have been made, and are now being made, in the temporary Houses of Parliament, asserting the positive failure of them, and urging the necessity for other and totally different arrangements in the new Houses. Our inquiries amongst the members of the House confirm, we are sorry to say, these assertions, and lead us to regard with fear and trembling the extravagantly expensive, and architecturally destructive, preparations for ventilating, which have been made by Dr. Reid. According to the "Brief outlines illustrative of the alterations in the House of Commons, in reference to the acoustic and ventilating arrangements," which Dr. Reid presented to Mr. Hawes' committee in 1837,

the principal object which he endeavoured to attain was,—“To introduce air equally over the whole floor, both in the galleries and in the body of the house; to sustain an equal flow at all times proportional to the number present, and to admit air either at natural temperatures or after passing through the heating apparatus, as might be required.” This, one would suppose, with no limits as to expenditure, and no personal scruples about cutting and hacking a building whether old or new, was not a very difficult task; and when the enormous machinery by which it was to be effected was seen, including a huge shaft 120 feet high, the object was considered to be as good as effected. Alas! for the vanity of human expectations.

The present House of Commons, lobbies, committee-rooms, and galleries, with the three hundred thousand little holes in the floor, are no better than the old House,—rather worse,—the currents are most offensive and hurtful, and the escape of the vitiated air slow and uncertain. Members say their feet are in an ice-pail, and their heads in a vapour-bath, in direct contravention of the old advice, to keep the feet warm and the head cool. But so it is, and members get soon fatigued, and some fall ill; while in *all*, according to Mr. Wakley, the seeds of bronchial disorders are implanted. Things therefore look serious, and when we find the works at the new Houses stopped and interfered with, architect's plans altered, and supports cut away with the simple direction that some other means must be found (whether there be any or none) to carry superincumbent weight, it is surely time for the public, if not the members, to look about them. We have watched the mode of proceeding both at the Liverpool Hall and Amise Courts, where the architect's plans seemed to us sadly treated, and at the new Houses of Parliament, and to speak the truth, are satisfied at neither place.

A short time since a letter on this subject appeared in the *Times* reminding the honourable persons whose duty it is to superintend the arrangement of the new Houses, that a contrivance was in operation for many years by which the atmosphere of the House of Lords was kept in a pure state, and at an agreeable and uniform temperature. The writer said of the apparatus that "it was planned, without any charge, by the ingenious Adam Walker, the philosopher, and laid down by the late Mr. Moser, of Soho, and it was, and I believe still is, used in her Majesty's Theatre. Surely, Sir, it is the duty of hon. members at length to free themselves from the deluding trammels with which Dr. Reid finds it his interest to surround them. If a plan of known efficiency exists, is its adoption to be prevented because the pecuniary interests of a bungling experimentalist are in a different direction?"

In consequence of this letter, several requests were forwarded to us, that we should examine Her Majesty's Theatre, where lately great improvement in the state of the air had been found, and lay before the public some particulars of the mode of ventilation pursued there. We accordingly applied to Mr. Lumley, the present proprietor, and received from that gentleman every facility desired. We went over the building with Mr. Charles Marshall, in whose hands the arrangements for ventilating the theatre are placed, and were compelled to arrive at the conclusion that the improvements in the ventilation alluded to, were chiefly owing to the increased attention paid to the means under their control, whereby they are adapted hour by hour to the varying circumstances to which such a structure is liable.

Between the ceiling of the pit and the roof there is a very large space appropriated as the painting-room, and in the sides of the roof there are a dozen or more skylights, made to open, by means of which much of the heated air that accumulates in the roof, brought up amongst other causes by the chandelier, is got rid of. Now, as an instance of the necessity of constant attention, and of the difficulty of laying down rules to be followed without discretion, it may be mentioned that if when the wind is in a particular quarter some of these lights be opened, the hot air, instead of escaping, is kept down upon the audience.

Three or four years ago, the ventilation being considered defective, Dr. Reid was called in to improve it; which he attempted to do by forming a large *louvre* about 10 feet square, in the roof, with a cowl to close it at the side from which the wind blows; the object being, not to bring cold air in, but to allow the heated air to escape. The single advantage that could be expected of this over the windows already mentioned is, that it should be self-acting,—that, instead of having on a change of wind to close the windows exposed to it and open those on the other side, the wind should itself effect the same operation. This, however, is not found always to be the case, and the cowl is not considered of great value by those who are engaged in the house. Another of Dr. Reid's operations was to convey fresh air to her Majesty's box. Here he employed a "blower,"—ill-constructed as it seems to us,—in an aperture connected with the external atmosphere, and opening into the box behind the silk with which it is lined. This employed two men the whole evening, but so entirely failed to produce a good effect, that it is now no longer used.

With this exception, there is no mechanical arrangement throughout the house to bring in air, and of the system "invented by Mr. Adam Walker, and laid down by the late Mr. Moser, of Soho," there is no trace. Windows have been opened in every available position, and it is by constant attention to these, under the direction of the gentleman before named (Mr. Marshall), who has found pleasure in the subject, and is pursuing it *con amore*, that the frequenters of the Opera House owe much of the comfort which has been found there, notwithstanding the unexampled crowds which fill it.

What is now wanted there, is a contrrollable arrangement to bring in air at the bottom, independently of the doors, the means of getting rid of it at the top being ample.\* To avoid unpleasant and dangerous drafts is of course the difficulty, as in all similar cases; but this would be lessened if it were oftener remembered that it is not so much cold air that is required as *PURE AIR*, and that by slightly raising the temperature of that which is introduced, even in summer, and bringing it in through numerous apertures, the chief end might be attained without the inconvenience described. In concluding this allusion to the Opera House, we cannot omit bearing testimony to the desire manifested by the present proprietor, Mr. Lumley, to increase the excellence of his theatre, as well in the particular to which our attention has been directed as in all others.† We shall return to the general question of ventilation before long.

\* Double doors might then be placed in the pit corridor, so as to lessen the dangerous draft now found by those who sit near the entrances.

† Our thanks are further due to Mr. Marshall for the kindness with which he assisted us in examining the building.